

1953

FIRST WEEK. March 2 through March 9.

Gulls come over the Hearth early in the morning. Do not land. On clear days they come below the tree-tops. On cloudy days they remain above the tree-tops.

March 3. Most of them arrived around 8:00, although a few arrived considerably earlier. March 4. Up to 200 appeared by 8:15. March 5, (very wet). Only a few appeared. March 6. Already 200 by 7:30. March 7. Large numbers by 8:30. March 8. Large numbers by 7:00.

Usually most of the gulls leave between 9:00 and 10:00. One or two may be around at any time during the course of the day.

On March 8 and March 9 large numbers of gulls spent the day in a neighboring flooded field. Most of these sitting on the water. Only watched them for a few minutes, and saw nothing but a little aggressive behavior.

The gulls usually arrive over the Hearth in small groups, coming in from rather different directions, North and East. (We have not yet found their night roost). They are silent on arrival.

While over the Hearth they just fly around most of the time. A great deal of "Long Call". A great deal of aggressive behavior. Some aggressive behavior is present at all times, but much more common when there are large numbers together. However, when the weather was fine, a large number of gulls together, flying below the tree-top level, the gulls were much less aggressive; but they were then liable to many sudden panics. (These panics, by the way, are similar to those seen later in the cycle on the ground. Birds fly very close together, circle, silent. Breaks up immediately. No visible cause).

Now to get to the aggressive behavior itself. Consists primarily of Chasing and Swooping.

Is there any difference in the role of the two sexes at this stage? Some birds (much less than half apparently?) are clearly more aggressive than others. Some birds never swoop or chase while we watch them over a period of a few minutes.

Chasing. Intergrades with Swooping. One sees what look practically like horizontal Swoops during a Chase. A real Swoop seems to end a Chase, but it is possible that the Chaser may then Swoop at other birds besides the original Chased. During a Chase both birds put on a sudden burst of speed, and they twist and turn in flight. Looks as if the Chased were trying to evade, and the Chaser to hang on. It is impossible to tell if any cries are uttered by either bird. They move too fast to see any particular posture. The Chase is usually not mutual, but I think it may be so sometimes.

2.

Swoop. No preparatory getting into position. The regular Long Call, of the aggressor, becomes higher, louder, and harder. During the Swoop this changes into the "attack" call. The Swoops themselves seem similar to those seen last year. Vary greatly in intensity. (Note. During the "hanging" part of the Swoop the wings are often not as V-shaped as I drew them, and the head is usually more bent). Neck usually down. Breast looks puffed out. Have seen gulls Swoop at pigeons, at crows, and at nothing at all. The Swoop is sometimes mutual. Sometimes practically simultaneous. Sometimes an interval supervenes before the original Swooper is Swooped at.

Is there a particular aggressive flight? A "Goose Flight"? Neck stretched out. Long Call uttered. Breast prominent.

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3.
SECOND WEEK. March 10 through March 16.

Period 1. March 10 through March 12. Before the gulls have come down on the hearth for the first time.

Aggressive behavior over hearth area. Aerial. Like that described in last weeks notes. Noticed that the gulls attacked herons, and sometimes crows. Sometimes, however, crows were unmolested as they wheeled in the midst of the flock. Aggressive behavior seems to be less common in the main body of gulls than in the small outlying groups. Aggressive behavior is also less conspicuous when the gulls are flying low in a tightly-packed bunch. Chasing and Swooping are less conspicuous now than when we observed them last week, (of course, we were out earlier in the day then, as there was no fog last week). We have several times observed mutual Swooping, and also Swooping at nothing at all (R. Mar 11, 2).

Aggressive behavior in flooded field. Gulls not territorial (M. Mar 11, 1). One very clear instance of courtship on water (M. Mar 10, 3). Descriptions of Chase and Swoop; drawings of Swoop (M. Mar 10, 5). Around noontime the gulls seem to spend their time circling alternately over the flooded field and over the hearth.

We also found some gulls in a distant field, which may have served as a field roost. Plenty of aggressive behavior. Very conspicuous Erect postures. Courtship? Probably Choking. Food-begging. Noticed that Panics very definitely started at one end of the flock.

In general, the behavior of the gulls during this period was the same as their behavior last week. Reproductive behavior has already begun. Courtship and aggression. Many of the birds are probably already paired. It is still doubtful exactly how territorial they are at this stage; at least semi-territorial in some cases. The gulls only seem to take an interest in the hearth for an hour or so in the morning.

4,
Period 2. March 13 through March 16. After the gulls have first come down on the hearth.

As far as their behavior in other places than the hearth is concerned, it seems to remain as before. Good description (relatively, that is) of their behavior on the flooded field in notes (M. Mar 13). Drawing of Chase (M. Mar 13, 1). Gulls in the field roost seem to get fewer and fewer each day. Possibly also true of flooded field.

Behavior on hearth. General remarks. On March 13 and succeeding days the gulls came down on both the hearth itself and the adjacent mere. They came down very gradually at first. Very panicky (see accompanying paper). Most of the gulls seem to be in pairs. Most are territorial. A great deal of aggression and courtship (takes much the same form as in previous week; more ground displays?). Courtship itself was less conspicuous the first day than on later ones.

Courtship. First definitely seen on hearth (M. Mar 14, 2, etc.) Courtship on water (M. Mar 14). Our best descriptions of courtship are contained in our notes of Mar 16.

Several instances of conspicuous aggressiveness on the part of the male during courtship (M. Mar 16, 19; R. Mar 16, 10-11-12-13-20).

At first glance, it does not seem probable that females are less aggressive than males during courtship.

Aerial display. Chasing and Swooping as before. Occurs very often after mutual display between partners on ground (see last year). In this latter case, we don't know which sex does it (M. Mar 16, 13).

Birds on water. Birds seem to be semi-territorial even here. Are those gulls on water the ones with the lowest sexual drive? When the birds first come down, they are packed closely together; later they scatter a bit. (This may also be true of birds on ground.)

Single males. There are some certainly. Hard to distinguish because the display of a single male is similar to that of a mated male when alone.

Upward. Orientation extremely variable. See M. Mar 16.

Forward. Also very variable in orientation. On water, the whole body, especially primaries and tail, seem particularly low (M. Mar 16, 7). Presumably wings are held out further. In one or two cases at least, the F was not preceded by a U, but rather by indications of FB (M. Mar 16, 9-~~10~~-11).

5.
Erect posture. Seems definitely homologous with the Upright Threat Posture of the Herring Gull. Very important. Obviously aggressive. Presumably, it is either lower intensity than the F, or possibly less of the escape drive is activated? Sketch (M. Mar 15, 3). When the male walks away in the Erect the female practically always follows him (and vice versa). Not used in the water very much (M. Mar 16, 12).

Once a bird was seen walking in the Erect and uttering a most peculiar call. Staccato, hen-like, (like broken-up Choking), "kh-kh-kh-kh-kh-kh-kh". (R. Mar 16, 17-18-19).

Head-flagging. Head is always turned away from partner or opponent. Seen in aggressive situations (M. Mar 16, 2-8). Sometimes the movement is repeated, and the head is really flagged, (M. Mar 16, 2; R. Mar 16, 2-3-4-5-10). An extreme case of HF went smoothly into Pr. (R. Mar 16, 7). Drawing, (M. Mar 16, 15), showing the peculiarly twisted neck often seen.

Circular flights and orientation on return. Both sexes definitely make these flights.

When one member of pair returns to its sitting partner there seems to be a characteristic orientation. Sitting bird is practically always facing away from the incomer. White nape may be prominently displayed. Is this merely coincidence, as sitting bird usually faces upwind? Doubt it. (M. Mar 16, 4).

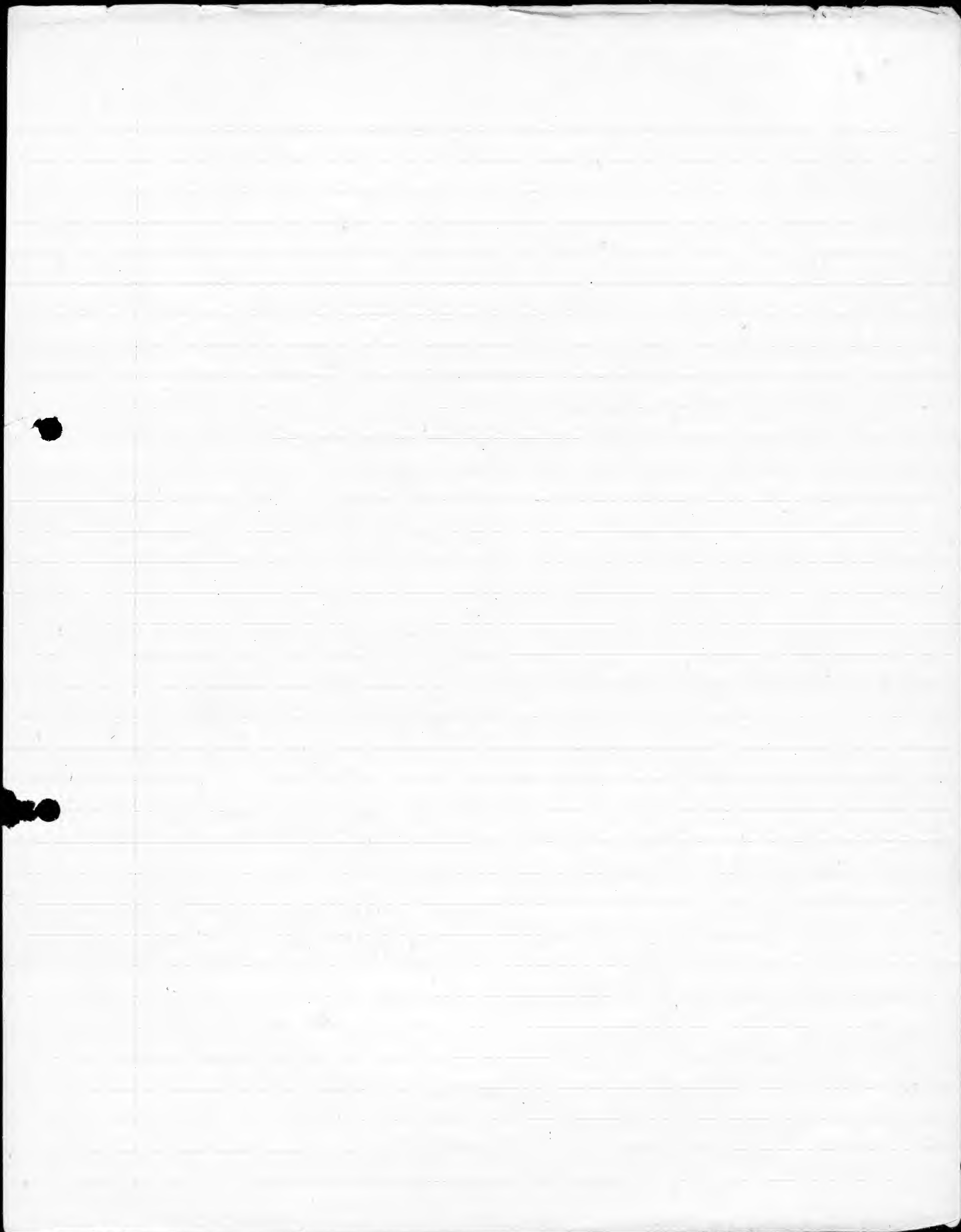
Choking. Surprisingly rare during this period. Very few birds do it, apparently. One example (M. Mar 13, 6). Seen once in presumably aggressive situation (R. Mar 16, 3). One or two pairs in friendly choking. Low intensity, tail not raised, but with characteristic utterance. (R. Mar 16, 2-3-4-7-14-15-16).

Food-begging and feeding of female. Slight indication in courtship; (food-begging that is.) (M. Mar 14, 5). Food-begging in aggression? (M. Mar 14, 3). Friendly, with the characteristic noise and bob, from an F. (R. Mar 16, 3-11-12-13). Definite cases of food-begging by the female, leading nearly, or completely, to feeding. (R. Mar 16, 19). Another case, (M. Mar 16, 15-17), where the male regurgitated and then swallowed again. During this performance he uttered sounds very much like Choking.

Nest-building movements??? Performed by both birds of pair, after food-begging. Especially when in Erect. (M. Mar 16, 18). Displacement? Feeding movements? Once the male picked up a leaf or a twig with this movement (M. Mar 16, 21).

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| March 13 | 7:13 — 7:16 |
| March 14 | 7:14 — 8:19 |
| March 15 | 7:05 — 7:44 |
| March 16 | 6:07 — 11:02 (no) |

✓ Aggressive behavior toward other species ^{if gulls} Kittiwake
 only slightly attacked (Mar 14, 22 etc). Gull-lays gulls are
 attacked more often, but still surprisingly unmolested



THIRD WEEK. March 17 through March 23.

March 17. Much like previous day, except for the fact that the gulls stayed on the hearth until 6:00 p.m.

March 18. Unchanged

March 19. First copulations, and Choking (low intensity) during feeding. Both Still rare.

March 20. The best day so far; a great deal of FB, Choking, etc. The great fight between D and DD.

March 21. Unchanged.

March 22 and 23. Much as before, but gulls considerably less active. Due to weather?

"THREAT BEHAVIOR" ON GROUND. First impression.

Erect. Definitely threat. Homologous with the Upright Threat Posture of the Herring Gull. Easily explained in terms of intention movements of attack and escape. Most aggressive form is with the bill pointing strongly downward.

HF and Bent Head. "Avoidance" movements. Intention movements of turning and fleeing?

Anxiety Posture? Like E, but the neck is thin and the bill is never pointed very strongly downward. Often combined with Bent Head and HF.

Long Call and associated postures. The Upward seems to be low intensity threat. Performed by birds on ground when flying gulls approach only moderately close, etc. Not usually (Never?) the immediate preliminary of an actual attack. The Forward is also threat. Probably "contains" a greater intensity of both attack and escape drives. In any case, the escape elements are more conspicuous than in the Upward. Indicated by submissive posture, etc.

"Aggressive" Choking. Still a mystery, but a little clearer than last year. Derived elements are easier to identify. The head down and the call come from the feeding of the female (sexual). (Are we justified in saying this? If the Choking seen during feeding is a complex of derived movements, these particular elements may have originally come from somewhere else.) The rapid opening and closing of the cloaca (and tail exceptionally high?)

are presumably sexual. The general tilt of the body, the occasional foot movements, and the occasional sitting down, seem to come from nest-building. Raised wing purely aggressive.

Differs from "friendly" Choking in some ways? Food is never actually brought up? We have not yet seen the cloaca opening and shutting during "friendly" Choking, but this is probably coincidence. Is "aggressive" Choking more intense than "friendly" Choking?

"Aggressive" Choking occurs in cases of high intensity ~~choking~~ conflict? Boundary disputes. Conflict of which drives? Attack and escape? What part does the sex drive proper play in it? Are we justified in rigidly separating "friendly" from "aggressive" Choking; one as autochthonous and the other as displacement?

"Grass-pulling"? In "aggressive" Choking we have often seen males peck at leaves and twigs, sometimes picking them up. Pecking often vigorous, twigs often shaken violently. Looks vicious.

References.

Forward. Pair, using F against opponents, often re-orientate to face each other (M. Mar 17, 11-14). Hasty discussion of F (M. Mar 23, 9).

Erect. Bill pointing strongly downward is more aggressive than bill horizontal (M. Mar 19, 7).

Head-flagging. Done against opponents, or, at least, against neighboring males (M. Mar 17, 4). Always away from "partner", changing as latter moves (M. Mar 17, 5-6).

Anxiety posture. Erect, with thin neck (M. Mar 17, 13).

"Aggressive Choking". Drawing (M. Mar 17, 8). Examples: (M. Mar 17, 9; M. Mar 20, 3 to 23; M. Mar 21; R. Mar 20, 6-7-8-9-11-12). Pecking at leaves and twigs during Choking (M. Mar 20 and 21). Choking when female leaves suddenly (is this aggressive?) (M. Mar. 21, 4). Description, with high tail (M. Mar 21, 7).

Food-begging. Female FB with different males (R. Mar 18, 8). Definite FB on water, first seen (R. Mar 18, 9). Females often fed by males from Mar 20 onwards.

Displacement during FB. On land, both birds peck at ground (R. Mar 18; R. Mar 20, 1-3; M. Mar 21, 8). On water, bill-dipping and head-shake (M. Mar 18, 4; M. Mar 19, 3-5-6; R. Mar 20, 4-12-13).

Aggression during FB. Male either pecks female, or attacks neighbors (M. Mar 18, 4-5-7; M. Mar 21, 4-8-18-19; R. Mar 20, 24).

Choking during FB. (M. Mar 19, 1-9; R. Mar 20, 1-2-3-10). ~~Firsttime~~ Sitting down, presumably high intensity (M. Mar 20, 2-3; R. Mar 20, 24-28). Both birds Choking (M. Mar 21, 14-16; R. Mar 20, 3). After the female leaves suddenly, (aggressive?) (M. Mar 21, 4)

Copulation. First seen (M. Mar 19, 8-12). Our only close view so far (R. Mar 20, 5).

Nest-building activities. No real nest-building seen yet. After feeding and copulation, male brought sticks (R. Mar 20, 11). Twice, on mainland, a bird carrying sticks flew off immediately afterwards to bathe (R. Mar 22, 5-6).

Territorial defense. Peculiar and interesting example (M. Mar 18, 9).

Reaction of other birds to an actual fight. Come circle over the combatants. Seen twice (M. Mar 20).

Reaction of neighbors to sexual display. Constant attacks by DD male whenever D female came back to neighboring territory (M. Mar 20 and 21; and lots more).

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FOURTH WEEK. March 24 through March 30.

Ingeneral, not a very good week. The first few days were as good as the previous week, but the weekend was marred by dreadful weather. This seemed to put the gulls back considerably. There seemed to be fewer gulls than previously, and those that were present seemed inactive. Nevertheless, they remained on the Hearth throughout the blizzard; (infact, they are now staying later at night: until 6:30).

References.

Swooping and Chasing. Seem as common as ever.

Ground Ceremony. Includes HF sometimes (M. Mar 25, 3-4). Concentrated toward mate? (M. Mar 25). Are they more cursory now, due to the advanced state of the breeding cycle? (M. Mar 27, 13).

Circular Flights. The sitting bird often shows its white nape (in E posture) to the returning bird (M. Mar 25). Examples of the aggressive flights of males (M. Mar 25 and Mar 26). Example of a female who showed no aggressive behavior during her circular flights (M. Mar 25). Does the sudden departure of the female, after a mutual display, provoke the male to an aggressive flight? (M. Mar 25, 11).

Mutual Display. It seems definite now that females usually remain in F longer than the males (M. Mar 26, 8). We have been paying some attention to the "pecking at the ground" that is often seen during Mutual Displays. References to this behavior pattern are scattered all through the week's notes. Is it an int. mov. of nest-building? Of feeding? Of regurgitation? Of Choking? Is it displacement? Once a bird was seen actually swallowing something (M. Mar 25, 4). Once a bird was seen to pick up a twig (R).

Feeding of the female by the male. Descriptions of this procedure are common all through our notes. Particular examples (R. Mar 24, 4; R. Mar 26, 2). The posture of the male certainly differs from the Choking posture. On the water, it is often accompanied by dipping the bill and head in the water and head-shaking. Presumably autochthonous. Examples of birds, on the ground, dashing to the water to perform these ~~feeding~~ preening movements (R. Mar 26, 5).

Example of a female, with
tail feathers raised, highly
(M. Mar 25, 16)

Aggression during or after feeding (M. Mar 26, 6-7; R. Mar 24, 5; R. Mar 25, 1-2-4; R. Mar 26, 5; R. Mar 27, 2).

Copulation. Incomplete (R. Mar 26, 6).

Nest-building. First signs (M. Mar 26, 5; R. Mar 26, 4-7). Then some extensive nest-building (M. Mar 27). Quite complete pattern. Male taking initiative. Several nest-sites.

"Aggressive" Choking. "Aggressive" Choking has been commonly observed every day. Always certainly threat, with one possible exception (M. Mar 26, 5). A clear and typical "aggressive" example (M. Mar 26, 2). Sketch of possible difference between Choking and Scraping Postures (M. Mar 27, 18). The male of a pair sometimes pecks the female during Choking (R. Mar 26, 3). Does the fact that the male "Kroons" in boundary-Choking explain why the female sometimes FB during such disputes? (M. Mar 26, 8).

It is possible that males sometimes Choke on returning alone from Circular Flights (M. Mar 26, 2).

Head-flagging. To flying birds (M. Mar 25, 3-7). Toward and opponent (M. Mar 27, 14-17).

Forward. The E posture changes immediately into an F when the opponent suddenly flies away (R. Mar 24, 4).

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THREAT BEHAVIOR (on the Ground). Three main types.

Pattern A. ERECT POSTURE. With (and sometimes without?) greatly thickened neck. Head-flagging. Bent head and neck.

Sometimes this looks like a pure intention movement of attack; and it is sometimes the prelude to an actual attack. I think, however, that we must presume that both the attack and escape drives are activated. Most of the time, for instance, an attack does not actually materialize after the E. During Mutual Displays and FB a gull in the E posture often runs away from its mate. During disputes a gull in the E posture sometimes runs away from its opponent. The HF and Bent Head, which seem intimately associated with the E posture, seem to be avoidance movements; are are presumably activated by the escape drive. It seems obvious that the relative intensity of the attack and escape drives, in the E posture, varies considerably. This is indicated by, among other things, the varying thickness of the neck, and the varying angles at which the bill is held.

Pattern B. LONG CALL. Characteristic call, Upward, and Forward.

There might be some dispute as to whether the constituent elements of this behavior pattern should really be grouped together in this fashion. For instance, the call is sometimes uttered unaccompanied by any marked, ritualized, posture (always indicated by a rudimentary U?). Moreover, it might be argued that the Upward should not be separated from the Forward. It is true, of course, that the Upward is most conspicuous when performed by a bird on the ground toward a flying bird. At first, therefore, it would seem as if the Upward were merely a particular orientation of the Forward. Further consideration would seem, however, to render this hypothesis untenable. In the first place, a marked F succeeds the U, even when the display is directed at a flying bird. Secondly, the U pattern often precedes or alternates with the F when swimming birds are disputing among themselves on the water, (in this case the head is held horizontal rather than tilted obliquely). We still do not know how frequently the U is directed by one gull on the ground toward another gull on the ground; (probably rather common, but usually hurried and cursory). Finally, the marked difference in the calls associated with the U and the F would seem to indicate that they are distinct, if closely connected. (It is still possible, nevertheless, that orientation plays a part in determining which of these postures will be adopted at any given time).

very frequent →

12.

The main difference between the U and the F would seem to be one of intensity. The F is most common when two birds approach each other closely. F is more often the preliminary to an actual attack (?). It is possible that the F represents a relatively greater intensity of the attack drive alone, but I doubt it. It sometimes precedes retreat (?). The orientation of the F is often peculiar; parallel with, or pointed away from, the opponent. The head may be bent or flagged away from the mate (or opponent?). This latter would seem to be caused by a relatively great activation of the escape drive. The actual posture itself would suggest the presence of strong escape elements.

Pattern C. CHOKING. A complicated derived movement (see discussion several weeks ago). Associated with pecking at nest material?

This pattern is also presumably due to the simultaneous activation of both the attack and escape drives. It is most frequent during lengthy boundary disputes. Often a prelude to actual attack. Is it ever a prelude to actual escape? It is noticeable that, during disputes in which Choking is employed, the birds in the Choke posture more often than not face away from their opponents. Due to activation of the escape drive?

DISCUSSION. The main problem involved in any attempt to elucidate the threat behavior of the Black-headed Gull is: why does it have so many different forms of threat?

These different types might, of course, be due to different relative strengths of the two drives involved. The above account, however, would seem to suggest that this is improbable. Each main threat pattern seems to vary considerably, within itself, as far as the relative strengths of the two drives are concerned. Could it be that the Erect threat pattern, the Long Call threat pattern, and the Choking pattern, represent increasing actual intensity of both drives?

What positive evidence do we have for this conclusion? All rather indirect. Reasons for thinking the E less intense than the U-F. When a complete mutual display is performed, the E practically always follows the U-F. This would suggest that part of the motivation has been consumed by the performance of the U-F; the remaining motivation causing the E. Moreover, as the breeding cycle progresses, mutual display between partners becomes cursory. But, if any part at all of the mutual display is carried out, it is the E. Reasons for thinking the U-F is less intense than Choking. Choking is never (or practically never) seen during mutual display between partners. It is particularly characteristic of long drawn-out boundary disputes, when one would normally expect that stimuli provoking both attack and escape would be strongest.

There is another, theoretical, consideration which might suggest that the Erect-Long Call-Choking progression is one of increasing intensity. As one goes up the scale these postures seem less and less explicable in terms of ambivalent intention movements; and they seem to incorporate more ritualized displacement activities. (What is the reference to calls originating as displacements?).

It should be noted that the threat patterns due to greater actual intensity of both drives (if the above hypothesis is correct) seem to be more "intimidating" than those due to lower intensity of these drives. Thus we have seen birds in E retreat from birds in the F and Choking postures. (This whole aspect of the problem has to be gone over thoroughly).

It should also be noted that, during a dispute, if one of the gulls involved adopts a certain threat posture (F or Choking) its opponent usually does. Seems to be contagious.

The other great problem involved in any attempt to describe and explain the threat behavior of the Black-headed Gull is the precise part played by the sex drive (in the restricted sense). It is presumably present whenever partners display to one another; (this display very often takes the form of threat). It does not, however, reveal itself in any overt act until comparatively late in the breeding cycle when FB, feeding, and copulations, occur.

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FIFTH WEEK. March 31 through April 6.

Rather a good week. Most of the pairs show a tendency to abandon the mainland.

References.

Mutual display. Orientation of the F. Variable, every type seems common. Male doing F away from female, before she lands (M. Mar 31, 4; M. April 1, 2; M. April 3, 5). Male actually re-orienting F away from female, before she lands (M. April 3, 2). Female does F away from male when he lands (M. April 5, 11). Male doing F pointed at female before she lands (M. April 3, 2).

The females usually come out of F later than the male; but there are some exceptions (M. April 1, 11).

The female jerking head away from male as she circles him in F (M. April 3, 11).

Male doing F with tail above wings (M. April 4, 4).

We have innumerable examples of gulls showing nape in E as mate lands; for instance (M. April 3, 4-6-7-10-11; M. April 4, 3-6; M. April 5, 1-2-11).

Repeated "flagging" by female (M. April 1, 8).

Cpr commonest under wing (M. April 1, 2). Male in Cpr relaxes the minute the female flies away (M. April 5, 7).

Male preening female? (M. April 1, 7).

Females usually relax immediately when males fly off

Upward. It is certain that this usually precedes, and alternates with the F when the birds are on the water (M. April 6, 6-7).

Forward. Done by a single bird, on alighting (M. April 3, 4). Toward mate during a boundary dispute (M. April 4, 5).

Erect. Other gulls (not in threat posture?) retreat before a bird in E (M. Mar 31, 3; M. April 6, 5;). Bird in E retreats before a bird in F (M. April 4, 7). Bird in E retreats before a bird in Choke (M. April 5, 6).

Tail above wings (M. April 1, 4).

If any part of the Mutual Display is performed at all, it is the E (M. April 4, 6).

15.
Head-flagging. With opponent (M. April 5, 5).

Pecking at ground. Seen during Mutual displays. Common when FB is proceeding (M. April 4, 5). Seen immediately after opponent flees (M. April 1, 11). During boundary disputes, by males, Choking int. mov. ? (M. April 5, 3).

Nest-building. Very rare this week (M. April 3, 12). Examples of picking up sticks (R. Mar 31, 2; R. April 4, 9).

Choking. Toward mate (M. April 6, 4; R. Mar 31, 1). Toward flying bird (M. April 5, 10; R. April 2, 4). By single bird, on alighting (M. Mar 31, 1). Aggressive, in dispute with neighbors (M. April 3, 9). Provoked by FB of neighbors? (M. April 5, 4). Provoked by neighboring copulation attempt? (M. April 5, 6). Female, who has just been unsuccessfully copulated with, Chokes at neighbor (M. April 5, 6). Choking with cloaca opening but without krooning (R. April 4, 1).

Copulation and preliminaries. Mutual FB (R. April 2, 3; R. April 4, 4). Momentary Mutual FB on water (M. April 4, 2.) Mutual FB, the male adopts E, flies off. Sign of aggressiveness? (M. April 1, 4). Mutual FB, male quite submissive (M. April 1, 5-9). Mutual FB, male with HB (M. April 1, 6). Male FB, first with HB, then in submissive (M. April 5, 5). Male makes FB cry in submissive, nibbles female (M. April 4, 6).

Unsuccessful copulations. Male FB in submissive before mounting the female (M. April 1, 3). Attempt without any preliminary HB (M. April 3, 6). Male FB in E without HB (M. April 3, 7-10). Male FB with HB, but without neck getting higher (R. April 2, 8). Male HB irregularly with call both on upbeat and downbeat (M. April 4, 5). Classical attempts; male first in submissive, then HB, call on downbeat (M. April 5, 6; R. April 4, 2-9).

Successful copulations. Classical type (M. April 5, 7). Male without HB (R. April 4, 8).

Female very aggressive after unsuccessful copulation (M. April 1, 9).

Female makes a few FB during copulation.

Feeding and female FB. Very common. Much as during previous week.

Similarity between F call and krooning? (M. April 1, 7). Peculiar call (R. April 2, 1). Male feeds female without krooning (M. April 4, 5). Male kroons before female FB, stops immediately on her departure (M. April 3, 5).

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Females seem to FB from E, with a varying amount of HB, quite commonly. Usually at beginning of FB. Gets more submissive as FB continues (M. Mar 31, 4: M. April 5, 1-7; M. April 6, 4).

Female headshake and preening during FB. Displacement? (M. April 6, 2-5).

Aggression during or after feeding (M. April 3, 6).

Aggression when female FB (M. April 3, 7-12; M. April 4, 4).

FB during boundary disputes. By females (M. April 5, 3).
By females, when mate F's toward her? (M. April 6, 5).

HEAD-BOBBING DURING FOOD-BEGGING.

The usual preliminary of copulation is mutual Food-begging. The typical, complete, Food-begging behavior of the male is as follows. He begins begging with his neck retracted and his head quite low. Gradually, however, he begins to bob his head up and down. With each succeeding bob, his head usually goes a little higher. Finally he mounts the female.

Last year we came to the conclusion that the increasing height of the males' head, at the climax of each upward bob, was an intention movement of mounting. It certainly usually precedes mounting. Support for this hypothesis is given by the following example. "A male runs after a female, who is running up and down the territory. He Food-begs constantly, in a very low posture. Whenever he catches up with her he begins Head-bobbing."

There may, however, be another explanation of the male's Head-bobbing during begging. What is usually considered typical Food-begging behavior, as exhibited by juvenal gulls of both sexes and usually by adult females, is probably a mixture of two different behavior patterns: the submissive posture and "pure" Food-begging. The submissive posture is characterized by the low carriage of the head, "hunched-up" on the shoulders. It is often seen, at least among young gulls, without Food-begging. Food-begging itself is characterized by Head-bobbing and the typical "kri" call.

Gull chicks, below a certain age (exactly what age?), beg with pronounced Head-bobbing. Juvenal birds beg in the submissive posture. Adult females also usually beg in the submissive posture; but sometimes, especially at the beginning of the performance, they may utter the Food-begging call when in the Erect Posture, or they may beg with definite Head-bobbing. This latter can hardly be considered in any way an intention movement of mounting.

Certain unusual examples of male Food-begging behavior may also throw some light on this problem. We have several times seen a male mount a female, after having begged in the submissive posture with no sign of Head-bobbing. We have seen this in the case of both successful and unsuccessful copulations. It is strange that a male would actually mount the female without showing any trace of the presumed intention movement of mounting.

Is it not probable, therefore, that the gradually increasing Head-bobbing of the male prior to copulation is "revealed" by the disappearing submissive posture? (This latter posture is presumably the result of an activated escape drive).

THE ERECT POSTURE.

This has been something of a problem. There are times when it precedes attack, and seems largely aggressive. At other times it precedes flight, and seems to be primarily due to the escape drive. Still other times, it seems obvious that both drives are highly activated.

In fact, what we have been calling the Erect Posture probably includes the homologues of both the Upright Threat Posture and the "Anxiety Posture" of the Herring Gull. There seems to be no rigid division between the two in L. ridibundus.

The Erect Posture would seem to be primarily an intention movement of flying. This is shown by the raised carpi, the occasionally raised tail, and probably by the extended neck. On this basic "skeleton", elements of both the attack and the escape drive may be superimposed. Elements of attack include facing or running toward the opponent, the downward pointing bill, the occasional inclining forward of the neck, and the thickening of the neck (?). Elements of the escape drive include facing away or running from the opponent, Head-flagging, the head bent away from the opponent, the bill horizontal, the neck feathers smooth, etc.

SIXTH WEEK. April 7 through April 13.

Rather a good week. Weather better. Gulls progressing.
The first egg was discovered on April 12.

References.

"Attack Call". Used on ground (M. April 13, 16).

Upward. Preparatory to attack (M. April 13, 16). (M. April 12, 4). During fierce dispute (M. April 13, 22). Immediately after "blunted" attack (very aggressive?) (M. April 13, 22). Alternating with Choking during boundary dispute (M. April 13, 27).

Definitely directed at a flying bird (M. April 13, 26).

Forward. Very often mates F at one another during disputes with neighbors, or intruders, for instance (M. April 13, 13). It is very common before an advance or an actual attack, for instance (M. April 12, 2-3; M. April 13, 20).

Relaxed bird (Semi E ?) attacks intruder who has been in lengthy F (M. April 13, 19).

Head away from opponent (M. April 9, 4).

Female in F longer than male (M. April 11, 4).

Mutual Display. Getting less elaborate this week. Very often only the E is seen.

Erect. Adopted by birds before fleeing, (M. April 13, 15-16). Extreme, thin neck, E adopted by bird who has been attacked (M. April 13, 19). Bird, advancing in "alarm" E, eventually driven off by U and F.

Adopted by birds before attacking, (M. April 9, 2). Attack in "aggressive" E at bird who does not display, but flees immediately (M. April 13, 10-18-19).

"Showing nape" in E still common, for instance (M. April 13, 4-10).

Tail raised above wing is not uncommon, several discussions (M. April 12, 5; M. April 13, 21).

Head-flagging. By partners, after U and F at flying birds (M. April 11, 4).

Pecking at ground. Following semi-aerial fight (M. April 9, 4). From E, during Mutual (M. April 11, 4). After Choking (M. April 11, 6).

Choking. Description, and discussion, of Choking Call. Comparison with the male's feeding call (M. April 13, 13-14-18-25-28).

Very common before attack, for instance (M. April 9, 2; M. April 11, 6; M. April 13, 20). Choking following actual attack (M. April 12, 3-4). Aggressive, between partners? (M. April 9, 5; M. April 11, 2). Choking by gull, on first alighting with mate. Followed by repeated Swooping, certainly aggressive (M. April 11, 6). At flying bird (M. April 13, 17). Choking in response to neighbors' display (M. April 13, 15-26). Stops immediately when opponent (?) flies away (M. April 11, 1).

Choking by a female when a male approaches and tries to mount her (M. April 13, 2).

Head bent away from opponent (M. April 9, 4).

Much pecking at ground (M. April 9, 4).

Choking on water (Mike's notes).

Reaction to other species of gulls. An adult Common Gull was not attacked while preening on the water, but was immediately molested when it flew up (M. April 12, 2).

Female FB, and feeding of the female by the male. These behavior patterns have been common all week. There is no need for particular references, unless behavior contains unusual points of interest.

Female food-begging, when quite alone (M. April 11, 2; M. April 12, 6). With H B.

In general, the female begins begging in a semi E posture, with some HB. Usually gets more submissive later on. Why? Possibly increasing sex drive? Or just due to the fact that the male puts his head down to regurgitate?

Female begs immediately when the male picks something up and eats it (M. April 13, 12).

Description of the male feeding call (M. April 12, 5). Male with tail unusually high (still not as high as during typical Choking) (M. April 13, 16). Male bends head down, kroons, regurges, after female has flown off (M. April 11, 7).

Juvenal food-begs and displacement nest-builds (R. April 10, 3).

Aggression by male during FB (M. April 9, 1-3-5; M. April 13, 6-17).

Aggression by female after being fed (M. April 13, 22).

Female makes U and FB alternately (R. April 10, 2).

FB by female, when male disputes with neighbors (M. April 12, 3; M. April 13, 13-22).

Pecking at ground during FB (M. April 13, 8-17).

Mutual FB, and male FB alone. Very common. For instance, (M. April 9, 2; M. April 13, 20-22-23; R. April 8, 3-4).

Mutual FB during boundary dispute (M. April 13, 27).

Copulation. Successful copulations. Male with HB (M. April 9, 4; M. April 13, 24; R. April 8, 1-6-5). Male without HB (R. April 7, 1; R. April 11, 2).

Unsuccessful copulations. Male with HB (M. April 9, 5; M. April 12, 3-4; R. April 10, 3). Male without HB (R. April 8, 2-4; R. April 10, 4; R. April 11, 3). On water (M. April 9, 6; and in Mike's notes).

Description of female posture during copulation (M. April 13, 16).

No call during copulation? (M. April 13, 16). Copulation with aggressive (?) calls (M. April 13, 24).

Attempted forced copulation (M. April 13, 2).

Female with long neck before copulation (R. April 12, 2).

Sequel to copulation. Birds in E (M. April 9, 1-4-5). (M. April 13, 17).

Female does not HF after copulation (R. April 7, 1-2; R. April 10, 1-2-5; R. April 11, 2-3; R. April 12, 2).

Female does H F after copulation (R. April 8, 1; R. April 10, 4).

Female FB after successful copulation (R. April 7, 2).

Female pecks male viciously after copulation (R. April 10, 2).

Male waggles tail after copulation. An after-discharge? (M. April 13, 17-24; R. April 11, 7).

Pecking at twigs after successful copulation (M. April 12, 1)

PAT after unsuccessful copulation (M. April 9, 1-2-4-5).

Nest-building activities. Common all week (especially M. April 13). Pecking up twigs during a boundary dispute (M. April 13, 27).

SEVENTH WEEK. 14th April - 20th April.
(All page references are April)

Not a particularly good week although weather excellent. Gulls around hide or mainland neither spend very much time there not are they very active during that time. We are waiting to get on to the Heath.

1. Upward.

We begin to think that U is more aggressive than F. Quite a number of examples of very aggressive U's this week.

Preceding attack. (M.14,2; M.15,12; M.19,8). Many O's done by unusually aggressive pair. (M.19,7). U during boundary dispute (M.15,13; M.17,10; R.14,3; R.14,4). U alternating with choking (M.19,9). U's between pair (R.14,1).

Drawing of U with spread wings (M.19,9).

U & F together emphasized common during disputes eg:(M.14,3; M.17,12).

2. Forward.

F attitudes who retreats immediately (M.14,5; M.19,5). F preceding attack on water (M. 18,1).

Partners F at one another when intruder birds (M.14,3). "H.F" in F (M.18,2). More F's done by intruder than owner of territory (M.19,3)

3. Mutual display.

Still performed. Often abbreviated. Classical M.d. on water (M.19,5). Male in F longer (M.19,10)

4. Erect posture.

Chasing opponents in E (M.14,3-5; M.15,12; M.17,5-11; M.19,3-6; R.14,7).

Aggressive E by female et male who later attempts mount. Male is less agg.E (M.15,2).

Agg. E change by female at neighbour (M.15,10). Attack call in E (M. 17,5). Attacks by female at strange male are preceded by E and HF (M. ?)

Bird flees in anxiety e (M. ?). Bird screams in E, opponent chokes & flees (R,17,3). Bird in E gives way to choking bird (R. 20,3)

5. Choking.

Description & slight discussion. Wings & tail caesed (M.14,2).

Alternating with U's (M.19,9). Preceding attack (M.15,9; M.19,6).

During boundary dispute (M.15,12; M.19,2-8; R.14,4). Following attack (M.17,6; M.19,7). Towards intruder collecting nest material (R.14,7&8).

Between members of a pair (M.15,1; M.19,11). Between pair ? and female chased off (R.14,1). Choking by female before attempted forced copulation (M.15,21; M.19,3). Choking in response to male FB (M.17,2). Choking by both birds, primarily female before male attempts mounting. Low intensity. Similar to feeding posture. Crooning sound (M.15,3). While female FB's (R.14,8). Female chokes while male regurgitates (R.20,4)

6. Relations with neighbours.

2 prs. quietly side by side. Habituation (M.14,3).

7. Communal area.

Very large area. Birds preen or collect nest material. Very little agg. behaviour. (M.18,1; M.19,10).

8. Relations with other species.

Canada geese not molested very much. (M.18,?). Moorhens within one foot of sitting birds on hearth. (R.)

9. Female FB alone.

When male discovered food and swallowed it. (M.15,8). During boundary dispute (M.15,13; M.17,7). Female FB with long neck (R.18,7)

10. Male feeding female on water.

Relatively rare now. Less aggression shown? (M.18,3; M.19,4).

11

11.1 Mutual FB.

With male HB (M.15,3; M.18,1; M.19,6). Both sub. (M.15,12). Male's neck getting hinger when he approaches female (M.15,6). During boundary dispute (M.15,13). In full sub. posture (R.14,5).

12. Copulations.

A. Unsuccessful: male with HB (M.14,4; M.15,8). Male without HB (M.17,12). Agg. by both birds (M.17,6; M.19,5). No bobbing and aggression in middle towards intruder (R.14,1)

Male in submissive (R.14,4). With bobbing, long neck and no attempt at mounting (R.14,5). Female very aggressive (R.15,2). Agg. during copulation (R.16,5). Aggression after copulation by female (R.16,5). F. from female to male after copulation. Male walks and brings back nest material (R.17,2). Mounts without begging or bobbing (R.20,2)

B. Successful: With H.B. (M.15,13.) Call (M.15,13; 17,33,9; R.14,3; R.18, Agg. particularly noticeable (M.17,9; M.18,1.)

With male beginning in submissive p. & female not begging at all (R.14,11)

13. Sequel to cop.

Male sideways builds (M.15,7,14) (M.18,2)

Erect posture (M.15,14; M.17,3,5,6,11; R. all over notes.)

Both birds H.F. (M.17,11) Male alone (M.17,3; M.19,1)

Male agg. (M.17,6; R.14,10)

Male tailwaggle (M.18,3)

Female F.B. (M.18,3)

14. Nest building

Drawing (M17,5) Description(M19,11) With crooning (M15,10)
Sideways building R,17,1)

15. Call like that made by male before feeding ;during chase
(R14,9)

16. Agg. towards juvenal (R,14,8)

17. Erect, choking & crooning (R,16,2;R18,2)

18. Male makes all cop. movements without female (R,18,4)

19. Nest building common all week.

2, Successful

Male little Bob with long neck (R. 23, 2: 27,8)
' and call (R. 23,3)
Male aggressive toward moorhen afterwards (R. 24,5)
Female food begs with long neck (R. 24,8)
Male very exaggerated head bob. Silent female. (R. 25,1)
Successful with a bird other than male who interrupted (R. 25,5: 26,
Long neck, head bob and call (R. 25, 8)

Sequels

1. Successful

Male in E, with head turning (R. 25,1)
Both in E. female begs once (R. 25,6: 25,7)
Male flaps, preens, and pecks ground. (R. 26,3)
Female begs at once, male H. F's with turning every time she
does so (R. 26, 5)
Male straight off female's back. Female U's and F's at
flying bird
Male E's, U's, E's and H.F's
Female in E., male fluffed out and pecks at ground.
Male E and H.F's
Male in E. Female U and F's at neighbor (R. 27,2)
Female rushes at neighbor in U, shaking male off as she does
so (R. 27,3)
Male H.F's, female shakes and preens. (R. 27,4)
Male H.F's with turning. Chokes with neighbor (R. 27,4)
Female very aggressive, pecked male after. Male in E. with very
raised carpal joints. (R. 27,5)
Male exaggerated H. F. with slight turning. Female slight one (R. 27,9)
Both relaxed and preened. (R. 27,10)

2. Unsuccessful

Male stood in E. collected nest material (R. 25,7)
Male chokes and P.A.T., Female U's at nearby bird and also P.A.T.
(R. 26,5)
Female U's and F's at neighbor. Male in E. and preens (R. 26,5)
Female slight H. F.
Male in E. and H.F's, female shakes and preens
Female H.F's, male in E. pecks at ground. (R. 26,7)

Eighth Week April 21 to 26

Martin in Holland looking for a little gull. This was the first week on the hearth. I went only once a day because Mr. Barber thought it better. For the most part the weather was foul. Gulls not at all shy of the hide. After gathering they came down within half an hour: after entering the hide within fifteen minutes. General impression much the same as last week.

Agression

Intruder F, U, H.F. Choking from owner intruder walks away.

Boundary, U. and choking (R. 23, 3;)

F, E and choking (R. 24, 6:)

Intruder U and E (R. 24, 1:)

Unfinished dispute, sequel of choking F, U, and E (R. 24, 4;)

Attack in E and long call with wings raised (R. 24, 7)

Boundary choke, cloacas opening, owner of territory P. A. T. (R 26, 1)

Choking at boundary, female begs (R. 26, 1;)

Fight, orientation of F etc. (R. 26, 3:)

Picking up sticks after feeding (R. 24, 5;)

Third bird aggressive ? --stands on top of copulating male already on female (R. 24, 6)

Female begs with neighboring male--interrupted by own male (R. 24, 5)

Female makes choking noise when scraping (?) (R 26, 4)

Display with juvenile, fight with juvenile (R. 27, 3) (R. 27, 8)

Copulations

one unsuccessful

Male little Bob with long neck, female no begging (R. 23, 1)

Male begs in submissive posture (R. 24, 1: 25, 3: 25, 4: 26, 7: 27, 1)

Male makes copulation call (R. 24, 1)

Male makes aggressive call as female starts to run (R. 25, 6: 26, 4: 27, 2)

Male bobs with low neck (R. 24, 3)

Very aggressive female (R. 25, 3: 27, 3; 27, 6:)

Attempt with another male ? (R. 26, 2 : 26, 11:)

Male begs with long neck, then regurgitates, then begs again (R. 27,

Male regurgitates food after attempted copulation (R. 27, 8)

Male regurgitates while on females back (R. 27, 10)

28th April - 4th May.

Atlet of agg. display by Juvenal. (R. 28. 1)

FB with another ♂ - not mate. (R. 28. 1)

♂ makes attack call when feeding ♀
(R. 28. 4)

♀ E's as ♂ has brought (R. 28. 4)

♂ rubbing ♀'s head. (R. 28. 5)

♀ U's at bird trying to mount

Chokup between pairs (R. 29. 2)

then to
♂ copulates with one ♀, but tails of flies
skipped on to the back of another (R. 29. 3)

bird of attempted copulation (R. 29. 4 + 6)

Agg. towards white headed bird (R. 29. 4)

Attempted cop. & chokes. (R. 29. 7)

♂ tried to mount sitting bird? (R. 29. 8)

Fight, one chased away & this bird
lands near another, F's & H-F's. M. wonders
whether it is after the case in disputes. Birds
& HF are those that ~~have~~ are weaker - &
want to show that they don't want to fight?

(R. 29. 8)

Pair? what of hide - HF away from
another during chokup. Does this not
point to chokup being aggressive, this case
of pair also. (R. 29. 9)

Sequences.

Suc:

Very agg ♀. (29. 2)

♂ thrown off. Chokes,
E & H-F. ♀ app. with v.
aggressive. (R. 29. 4)

♂ E & H-F.; ♀ U & F.
(R. 29. 7)

♂ HF & Ph.

♂ HF twice, ♀ E & pecks
at ground. (R. 29. 7)

♂ E. Shakes, ♀
Shakes Ph.

♂ chases another who
before cop. was as near,
& unmolested. (R. 1. 3.)

♀ FB's at tree. (R. 2. 2.)

HF start wobble. (R. 3. 8)

Unsuc:

Inst.

(R. 29. 4 + 6)

♀ v. agg. after chase ♂
away. (R. 1. 4)

Attempt with bird other
than mate (R. 2. 2)

28 April - 4th May

Twee'd carrying nest material, builds & defends territory. (R. 29.9) (R. 3.4)

Three fight. One bird HF's away from opponent & dashes at 3rd bird. Doesn't seem to support N's hypothesis. (R. 29.9)

Nest relief. No call. (R. 30.1.)

♀ nest relieves - makes noise like swooping. Sideways builds a little when ^{she} gets on
nest. (R. 30.2), (R. 1.6)

♀ good prelims. to cop. (R. 30.2)

♀ makes marked HF after ♂ - some moments before he lands (~~R. 30.1~~ 1. May. 2)

(Chokes before feeding? R. 1.5)

Cop call. (R. 1.8) (R. 3.8)

♂ collects nest material when trying to share. (R. 1.8 & 9)

Copulation, more begging & another copulation some moments after ♂ dismounted
(R. 2.4).

Choking, P.A.T & build up after attempted cop with another ^{real} ♀. Then another
bidding where male - carries lines etc. (R. 3.2)

MU.

Cop. with Twee'd. R. 3.3)

Displacement build up & various "stabbing" by ♂ after failure to cop. (R. 3.5)

♂ FB's & 2nd nest. (R. 3.5)

Reactions to Choptoe. (R. 4.1, 2, 3 & 4.)

5th - 11th May.

Focus now on observations sporadic. Expts. with eggs & models begun.
Last egg collecting on 7th May.

Sideways building movements during chokup. R. 6 May, (2)

♀ FB's to chokup ♂. Is fed. R. 7th ①

♀ runs to eat food calling attack call R. 7th ①

Exaggerated display with ♀ from ♂ who has just had fierce fight. Is this always the case? R. 7.2.

♂ watches his ♀ being assaulted by another ♂. He does nothing. R. 7.2.

♂ HF's, not away from partner but away from bird whom he has just vanquished R. 7.3.

♂ furiously attacks another ♂ copulating with his (1st) ♀. Attacks are from U & alternate with chokup. R. 7.3.

Juv. ♀ + FB's - but seems 1/2 afraid. HF's many times between FB's. R. 7.6

♂ screams attack call after successful copulation. R. 8.2. [Twice]

Reaction to minor. Fear? - ve R. 9.①

Feeding & copulation in pair with egg. R. 10 ①.

D-5. New set to in station with
the following

